

'Preventing a LIONfish invasion in the MEDiterranean through early response and targeted REmoval'



«Preventing a lionfish invasion in the Mediterranean through early response and targeted removal (LIFE16 NAT/CY/000832). With the contribution of the LIFE financial instrument of the European Union / www.ec.europa.eu/life» Niki Chartosia, University of Cyprus



RELIONMED: Έγκαιρη απόκριση και στοχευμένη απομάκρυνση του λεοντόψαρου ώστε να εμποδιστεί η εισβολή στη Μεσόγειο



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Biological features of lionfish, Pterois miles (Bennett, 1828)

- Inhabits both shallow and deep waters (0-300 m)
- Long lived species (>10 yrs)
- Sharp venomous spines along dorsal and anal fins
- Daily consumption of prey 2.5-6% of their body weight
- Generalist predators
- Can grow up to 43 cm and 1.1 kg
- Sexually mature in less than a year
- Females can lay over 2 million eggs per year
- Nocturnal hunters







Lionfish venomous spines





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First Round of Stakeholder Consultations in RELIONMED Action A1

Background & Facts

- Displayed one of the most ecologically harmful marine fish invasions to date
- Factors that contribute: naive prey, predation protection, unhabituated potential predators, early and rapid reproduction, wide niche, high versatility, climate change...
- Lionfish population in Europe is expanding rapidly.
- Evidence from the coasts of Cyprus indicates that the invasion 'hotspot' is at our door step, particularly at the eastern side of the island in/near Natura 2000 sites and MPAs, where lionfish form groups and reproduce.





Potential threats to biodiversity

- Lionfish invasion could strengthen the impacts on foundation species and ecosystem engineers, by acting synergistically with other anthropogenic stressors
- Increase algal growth
- Compete with the native mesopredators for prey
- Lionfish have been found to cause significant reductions in native fishes







Potential socio-economic impacts

- Decrease in abundance of commercially important species
- Degradation of important habitats
- Public health threat due to its venomous spines
- Deter diving tourism and bathers









Lionfish in the Mediterranean

- First recorded in the Mediterranean in 1992 from Israel and after two decades of silence recorded again off Lebanon in 2012
- Since 2014, its population expanded significantly in Cyprus











Lionfish in the Mediterranean

 By 2015-2016 the lionfish reached the coasts of central Mediterranean (Tunisia and Italy)





Azzuro et al. 2017, BioInvasions Records



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53rd European Marine Biology Symposium, Ostend 17 – 21 Sep 2018

RELIONMED overview

Partners:



- **2 Universities** (University of Cyprus coordinator, University of Plymouth)
- **1 SME** (Marine & Environmental Research (MER) Lab Ltd)
- **1 NGO** (Enalia Physis Environmental Research Center)
- **1 Governmental body** (Department of Fisheries and Marine Research <u>Duration</u>:

01/09/2017 - 01/09/2021 (4 years)



Which are RELIONMED's targets

Assess the risks, increase awareness and create social capital;



- Create a surveillance and early detection system (become part of MedMIS system) (2019);
- Develop RATs (Removal Action Teams) and demonstrate coordinated and opportunistic removals of lionfish around Cyprus, guided by the surveillance system (2019);
- Focus on priority habitats (including Natura 2000, MPAs);
- Explore potential small local market niches that would make future removals economically sustainable (consumption, jewellery) (2019);
- Develop tools for managers (model/guides) so that the built capacity can be transferred and replicated in other countries of the Mediterranean.



Stakeholders event & press conference organised in UCY, June 2018







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1st Monitor Visit, Nicosia, Cyprus

First results of the project

1. Stakeholders and public perceptions regarding lionfish



Broad topics covered in lionfish questionnaires to the public and to marine stakeholders in Cyprus, Oct-Nov 2017

Public telephone surveys (n=300)	Marine stakeholder meetings (n=108)
Perception of the threat of lionfish as an invasive species.	Perception of the threat of lionfish as an invasive species
Perception on future strategies	Perception on future strategies
Socio-demographics	Abundance of lionfish
	Effects of lionfish
	Management of lionfish
	Project and communications

Low public awareness yet high stakeholder concerns

Stakeholders and public knowledge & perceptions about lionfish

One of the most remarkable result of this survey, was that the majority of the public have not heard before about lionfish and the impacts it can have either on environment or on health!!!!





Perceptions of the stakeholders and the public on different management measures and strategies

It seems that mainly the public wouldn't consume or buy any products made of lionfish.

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the





Agreement of stakeholders for specific reasons to participate in removal lionfish efforts

efforts.



First results of the project

2. Biology and ecology of the lionfish



- > A total of **268** lionfish from Cyprus were sampled and analysed
- Morphometric measurements were conducted, and lionfish growth rates, reproduction, and diet were examined using otoliths, gonad and stomach examination respectively.
- Tissue samples were obtained from 56 individuals and DNA analyses was conducted.



First results of the project

Among others..



- Length frequency analysis and otolith readings identified the presence of 4 annual age classes
- Otolith and gonad analyses showed that lionfish may become mature in less than a year of age
- Lionfish can be characterised as generalist predators, as its diet constituted mainly of a range of teleost and crustacean prey, whereby some are of high economic value (e.g. Spicara smaris and Sparisoma cretense)
- Genetic analyses demonstrated a low genetic diversity and resembled individuals from the Red Sea, and further some of them showed higher genetic similarity to *P. miles* from the Indian Ocean



Submitted publications

Coming soon:



- Kleitou P. et al., 2019. Invasive lionfish in the Mediterranean: low public awareness yet high stakeholder concerns. *Marine Policy Journal*, 104: 66-74
- Dimitriou A. et al., Genetic data suggest multiple introductions of the lionfish (*Pterois miles*) into the Mediterranean Sea.
- Savva I. et al., They are here to stay: The biology and ecology of lionfish at the EU's first invasion point.









The success of RELIONMED relies on the contribution of stakeholders

We need your support !!!

Involvement of citizens and stakeholders in ecological science

- Report lionfish sightings through the surveillance system
- Help us monitor and understand lionfish impacts
- Involve in management actions
- Spread the word







Thank you!

http://www.relionmed.eu/

